UNIVERSITY OF HAWAI'I LIBRARY

Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

MERRITT LYNDON FERNALD, Editor-in-Chief

CHARLES ALFRED WEATHERBY
LUDLOW GRISCOM
STUART KIMBALL HARRIS
} Associate Editors

Vol. 42. August, 1940. No. 500.

CONTENTS:

Some Plants recently found in the Coastal Plain of Maryland. *A. V. Smith.* 277

A little-known Collection from Missouri. *W. A. Anderson.* 280

Some Spermatophytes of Eastern North America (concluded). *M. L. Fernald.* 281

On two weedy Crucifers. *Reed C. Rollins.* 302

Contributions to the Botany of Michigan, No. 17. *Oliver A. Farwell.* 306

Globose Form of Pitch Pine (Pinus rigida) in Virginia. *H. A. Allard* 308

The New England Botanical Club, Inc.

8 and 10 West King St., Lancaster, Pa.

Room 1001, 53 State St., Boston, Mass.

QK
1
.R47

RHODORA.—**A monthly journal of botany, devoted primarily to the flora of New England. Price, $2.00 per year, net, postpaid, in funds payable at par in United States currency in Boston; single copies (if available) 20 cents, numbers of more than 24 pages or with more than 1 plate at higher prices. Volumes 1–8 or some single numbers from them can be supplied only at advanced prices which will be furnished on application. Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be considered for publication to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than two pages of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.**

Address manuscripts and proofs to
M. L. Fernald, 14 Hawthorn Street, Cambridge, Mass.

Subscriptions (making *all remittances* payable to RHODORA) to

Ludlow Griscom, 8 W. King St., Lancaster, Pa., or Museum of Comparative Zoology, Cambridge, Mass.

Entered at Lancaster, Pa., Post Office as Second Class Mail Matter.

INTELLIGENCER PRINTING COMPANY
Specialists in Scientific and Technical Publications
EIGHT WEST KING ST., LANCASTER, PA.

CARD-INDEX OF NEW GENERA, SPECIES AND VARIETIES OF AMERICAN PLANTS, 1885 TO DATE.

For American taxonomists and all students of American plants the most important supplement to the Index Kewensis, this catalogue in several ways exceeds the latter work in detail, since it lists not only the flowering plants, but ferns and other vascular cryptogams, and includes not merely genera and species, but likewise subspecies, varieties and forms. A work of reference invaluable for larger herbaria, leading libraries, academies of sciences, and other centers of botanical activity. Issued quarterly, at $22.50 per 1000 cards.

GRAY HERBARIUM of Harvard University,
Cambridge, Mass., U. S. A.

MEMOIRS OF THE GRAY HERBARIUM. A series of illustrated quarto papers issued at irregular intervals, sold separately.

No. III. The Linear-leaved North American Species of Potamogeton, Section Axillares, by M. L. Fernald. 183 pp., 40 plates, 31 maps. 1932. $3.00.

No. IV. The Myrtaceous Genus Syzygium Gaertner in Borneo, by E. D Merrill and L. M. Perry. 68 pp. 1939. $1.50.

Gray Herbarium of Harvard University, Cambridge, Mass.

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 42. August, 1940. No. 500.

SOME PLANTS RECENTLY FOUND IN THE COASTAL PLAIN OF MARYLAND

A. V. Smith

The following plants have recently been collected by the writer while botanizing on the Coastal Plain of Maryland and adjacent Delaware and Virginia. The records are from Wicomico, Worcester, Prince George's, and Anne Arundel Counties, of Maryland; Sussex County, Delaware; Accomac County, Virginia. One species is recorded from the District of Columbia, a little west of the Coastal Plain.

Some of the plants noted are common in other provinces,—particularly in the Piedmont Plateau of Maryland, but represent isolated colonies on the Coastal Plain. Others of the plants are of interest as uncommon pine-barren species, as new county records, or as species near their range-limits.

Ptychomitrium Drummondii Sulliv. This southern moss occurs on the trunks of trees and even on old roofs in southern Delaware and adjacent Maryland. Dr. A. J. Grout has informed the writer that this appears to be an extension of range northward from Virginia and Tennessee.

Buxbaumia aphylla L. This moss of such unusual appearance and supposed rarity is surprisingly common on bare soil in pine woods of eastern Maryland and southern Delaware.

Hypnum crista-castrensis L. This moss is said to be at its best when growing on rotten wood in cool mountain forests. That it does venture into the Coastal Plain is attested by a small colony in a damp depression in pine woods near Millersville, Anne Arundel County.

Dryopteris cristata (L.) Gray. On the Eastern Shore of Maryland the commonest swamp ferns are the chain ferns, the cinnamon fern, and the royal fern. A little of this *Dryopteris* occurs at the edge of a swamp about three miles north of Salisbury, Wicomico County, apparently the only known station in southeastern Maryland.

Dryopteris marginalis (L.) Gray. This fern is common enough elsewhere but is a rarity on the Eastern Shore. The writer recently found one plant growing in rich woods about eight miles southwest of Salisbury.

Osmunda Claytoniana L. During the summer of 1939 the writer found three plants of this fern growing in rich woods near Wattsville, Accomac County, Virginia, apparently many miles from any other known station.

Ophioglossum vulgatum L. var. pycnostichum Fernald. A small colony of this plant is to be found in rich woods about one mile north of Girdletree, Worcester County, Maryland.

Lycopodium clavatum L. A little of this clubmoss occurs in a damp hollow near Millersville, Anne Arundel County.

Lycopodium lucidulum Michx. This plant is occasional in damp spots in woods of eastern Maryland and southern Delaware. One colony is near Snow Hill, Worcester County.

Manisuris rugosa (Nutt.) Ktze. This southern pine-barren species has not been found in Maryland but has long been known from southern Delaware. The writer recently found an apparently new Delaware station, about one mile north of Georgetown, Sussex County. Unfortunately, the area is being converted into a dump heap, and the destruction of a fine colony of the plant seems inevitable.

Andropogon ternarius Michx. This grass is very common on the lower Eastern Shore and in southern Delaware. West of the Chesapeake Bay it appears to be at its known northern limit at Collington, Prince George's County, Maryland.

Arundinaria tecta (Walt.) Muhl. The small cane reaches its known northern limit at the well-known station at Stony Run, Anne Arundel County. The species appears to be absent east of the Chesapeake Bay. The writer has found a new station near Glenburnie, Anne Arundel County, not so far north, however, as the Stony Run station.

Rhynchospora Torreyana Gray. This uncommon pine-barren species occurs in a low clearing in Wicomico County, about six miles southeast of Salisbury.

Veratrum viride Ait. A large colony of this species makes a fine early spring display in a swamp about five miles south of Berlin, Worcester County.

LACHNANTHES TINCTORIA (Walt.) Ell. The red-root appears to be absent from Maryland but is known from a few places in southern Delaware. The writer has found the species growing abundantly at the same station given above for *Manisuris*.

POGONIA OPHIOGLOSSOIDES (L.) Ker. This orchid occurs in great abundance in the beds of several drained millponds of Wicomico and Sussex Counties.

CORALLORHIZA ODONTORHIZA Nutt. This fall-flowering plant occurs in pine woods about two miles south of Salisbury, Wicomico County.

ARENARIA PEPLOIDES L. var. ROBUSTA Fernald. This northern strand plant occurs about three miles north of Ocean City, Worcester County. The species has been recorded as far south as Cape Henry, but colonies in Delaware, Maryland, and Virginia appear to be few and far between.

CLAYTONIA VIRGINICA L. The spring beauty is a rarity on the lower Eastern Shore. One small colony occurs in rich woods about six miles west of Berlin, Worcester County.

AQUILEGIA CANADENSIS L. The columbine grows abundantly on a slope on the left bank of the Wicomico River, about one mile below Salisbury. The colony is many miles from any other known colony and is not known to be an introduction.

SANGUINARIA CANADENSIS L. The bloodroot grows in rich woods on each side of the Maryland-Virginia line near Greenbackville, Worcester County, apparently far removed from more inland centers of occurrence.

DENTARIA LACINIATA Muhl. This species occurs sparingly in rich woods near Wattsville, Accomac County.

SARRACENIA PURPUREA L. The pitcher plant is local in swamps of eastern Maryland and southern Delaware. *Chamaecyparis*, the southern white cedar, is often an indicator of the pitcher plant.

CHAMAEDAPHNE CALYCULATA (L.) Moench. This northern bog shrub appears to be absent from eastern Maryland and southern Delaware. A station at Glenburnie, Anne Arundel County, has long been known. The writer recently found a much larger colony at Round Bay, in the same county. *Sarracenia* and *Chamaecyparis* also occur here.

TRIENTALIS AMERICANA (Pers.) Pursh. A small colony of the star flower was discovered by the writer in Rock Creek Park, of the District of Columbia, a little west of the Coastal Plain. This appears to be the first record for the region.

OBOLARIA VIRGINICA L. This species is occasional in rich woods in the northeastern part of Accomac County.

LOBELIA ELONGATA Small. A little of this plant occurs at the edge of a marsh along the left bank of the Wicomico River at

Upper Ferry. Dr. Rogers McVaugh has informed the writer that this appears to be the first record for Wicomico County.

Erigeron pulchellus Michx. This spring-flowering composite occurs in rich woods in the southeastern corner of Worcester County, just north of the Virginia line.

Prenanthes autumnalis Walt. This pine-barren species occurs sparingly in a low clearing about six miles southeast of Salisbury, Wicomico County, apparently the first record for the plant in the region since it was collected by Commons and Canby prior to 1895.

Langlois Herbarium,
Catholic University of America.

A Little-known Collection from Missouri.—In Rhodora **42**: 98 (April, 1940), Steyermark records as a new species for Missouri, *Isotria verticillata*, collected by *Savage* and *Shull* near Poplar Bluff; specimen in the Herbarium of Field Museum. The name Shull is a notable one in American biology, so it is easy to see why it might get into a paper as a misprint of a similar name, and so it is in this case. The collection was made by *Savage, T. E.*, and *Stull, Wilfred*, who were students at the State University of Iowa in the late Nineties and who spent the summer of 1897 collecting plants around Poplar Bluff and Ironton, Missouri. Our herbarium has a set of these plants, probably the original one. *Pogonia verticillata*, collected August 3, 1897, bears the number 1362, though our lists account for only about 450 specimens.

Both of these men went into other fields of scientific work. Stull was a chemist, Ph.D., Harvard, 1903, was connected with the Mallinckrodt Company from then until his death in 1937. Savage became a geologist, Ph.D., Yale, 1909, and has been connected with the Illinois Geological Survey and University of Illinois for many years. We have other sets of plants bearing his name, mostly from the northwestern United States.

In a state as thoroughly explored as Missouri, it is interesting that this youthful collection of two men who were not primarily botanists should yield a new record after all these years.—W. A. Anderson, State University of Iowa, Iowa City, Iowa.

SOME SPERMATOPHYTES OF EASTERN NORTH AMERICA

M. L. Fernald

(*Continued from page 276*)

Rubus parviflorus Nutt.—a Confession.

Professor Bailey calls my attention to a humiliating error. On p. 275 I rejected *R. parviflorus* Nutt., stating that I had overlooked "the very simple fact that the latter is a later homonym of *R. parviflorus* L. Sp. Pl. 1197 (1753)." The actual fact, most unfortunately, is that the Linnean species was *R. parvi*folius. *R. parviflorus* Nutt. is the valid name for the North American species.

Rubus hispidus L., var. **obovalis** (Michx.), comb. nov. *R. obovalis* Michx. Fl. Bor.-Am. i. 298 (1803).

True *Rubus hispidus* L., as shown by Bailey in Gentes Herbarum, i. 174, fig. 77 (1923), is the coarse extreme of the species, with copiously setose primocanes and petioles. It is in part *R. hispidus*, var. *major* Blanchard in Rhodora, viii. 213 (1906), Blanchard taking the less bristly and more slender *R. obovalis* as his *R. hispidus*. I distinguish the two as follows:

R. hispidus L. (typical). Canes woody, the stronger portions 2–5 mm. in diameter; primocanes with 300–2000 bristles and glands on a dm. of the median and terminal growth; petioles of principal new primocane-foliage with 100–500 bristles; terminal leaflet of primocanes 2.5–7 cm. long, 2–5.5 cm. broad.

Var. obovalis. More slender; canes weaker, mostly 1–2 mm. in diameter, quite smooth or with only 1–100 bristles per dm.; petioles of primocane-foliage smooth or with 1– rarely 100 bristles; terminal leaflet 1.5–4.5 cm. long, 1–3.5 cm. broad.

The slender var. *obovalis* is wider-ranging and extends farther south than the coarser and more bristly typical *R. hispidus*. I have studied the material in the Gray Herbarium and the herbaria of the New England Botanical Club and of the National Museum of Canada. These collections give the following results.

	Typical hispidus	Transition	Var. obovalis
So. Quebec and so. Ontario	14	0	5
Prince Edward Island and New Brunswick	8	0	0
Nova Scotia	6	2	12
Maine, New Hampshire and Vermont	50	4	55
Massachusetts	13	2	72
Rhode Island and Connecticut	3	1	17

	Typical HISPIDUS	Transition	Var. OBOVALIS
New York	4	5	4
New Jersey	2		7
Virginia	1		5
North Carolina	0		2
Ohio	0		1
West Virginia	0		1
Indiana	0		2
Michigan	1		0

RUBUS, subg. EUBATUS, § **Tholiformes,** nom. nov. § *Hispidi,* ser. *Jacentes* Bailey, Gentes Herbarum, i. 248 (1925). § *Jacentes* Bailey, ibid. ii. 300, 346 (1932).

True *Rubus jacens* Blanchard in Torreya, vi. 147 (1906), is, as originally stated by Blanchard, a small member of the *Hispidi,* with slender canes trailing, and elongating to about 1 m. It is a local plant of dry clearings and pastures from the warm Connecticut Valley of southwestern New Hampshire (tobacco country) to southeastern New York and eastern Pennsylvania. The coarse arching or doming plant, so abundant in Nova Scotia and in the White Mountain region, thence extending northward into Quebec and west across northern New York, not only makes complex domes, with arching to ascending primocanes, but its long curving branches, reaching the ground, trail for 2–3 meters and then root. This coarse plant, misidentified by Brainerd and Peiterson (Blackberries of New England, Vt. Agric. Expt. Sta. Bull. 217: 77 (1920)) and later by Bailey (in including the Nova Scotian plant) is very unlike true *R. jacens.* It is the species I am calling *R. adjacens.* Since I can hardly place *R. jacens* in a section apart from the equally depressed *R. hispidus* Michx., *R. vigil* Bailey and *R. cubitans* Blanchard, and since *R. adjacens* has the coarser and doming habit of *R. permixtus* Blanchard, *R. arcuans* Fern. & St. John, *R. tardatus* Blanchard, *R. severus* Brainerd, and *R. novanglicus* Bailey (members of § *Jacentes,* as treated by Bailey) this doming and arching section can hardly be called § *Jacentes* (based on *R. jacens*). On account of the arching or doming habit of growth, the chief diagnostic character of the section, which separates it, on the one hand, from the prostrate § *Hispidi* Rydb., on the other from § *Setosi* Bailey, erect plants without long-arching and tip-rooting canes, I am renaming § *Jacentes* as defined by Bailey, l. c., and basing the

Photo. H. G. Fernald.

RUBUS THOLIFORMIS: FIG. 1, characteristic primocane-leaf, × 1; FIG. 2, summit of petiole and bases of leaflets, × 5; FIG. 3, lower surface of leaflet, × 10.

Photo. H. G. Fernald.

RUBUS THOLIFORMIS: FIG. 1, portions of floricane and inflorescences, × 1; FIG. 2, flowers and pedicels, × 5; FIG. 3, portion of primocane, × 3.

name on the characteristic doming *R. tholiformis,* which admirably displays the habit of the section.

Rubus (Eubatus, § Tholiformes) **tholiformis,** sp. nov. (tab. 606 et 607), valde arcuans cannis tholos formantibus, cannis vel ramis ad 1 m. longis apice saepe radicantibus; primocannis 3–7 mm. diametro densissime griseo- vel fusco-glandulosis setosisque, setis divergentibus 1–2 mm. longis aculeiformibus subrigidis; primocannae foliis quinatis ternatisve chartaceis pallidis opacis glabris, costis subtus prominulis pilosis; foliolis elliptico-ovalibus plerumque basi apiceque acuminatis duplicato-serratis; foliolo terminali 7–11 cm. longo 3.5–6.5 cm. lato basi subrotundato petiolulo glandulifero setosoque 1.2–2.4 cm. longo; floricannae foliis ternatis, foliolis obovatis vel late ovatis acutis anguste serrato-dentatis; inflorescentiis corymbosis vel corymboso-racemosis rhachis pedicellis calycibusque griseo-villosis; bracteis saepe trifidis; pedicellis subadscendentibus 1–2 cm. longis glandulosis plus minusve setosis; calycis glanduloso-setosis, lobis brevibus deinde reflexis; petalis 0.5–1 cm. longis, 3–4 mm. latis; fructibus subglobosis 1–1.3 cm. diametro.—Abundant in Coös County, New Hampshire: sandy terraces of Connecticut River, Stewartstown, September 4, 1917, *Fernald & Pease,* no. 15,600; damp or springy thickets, Colebrook, July 18 and 19, 1917, *Fernald & Pease,* no. 15,723, September 3, 1917, *Fernald & Pease,* nos. 15,604 and 15,605; dry bushy hillside, Colebrook, September 3, 1917, *Fernald & Pease,* no. 15,661; sandy plains, thickets and roadsides, Stratford, July 18, 1917, *Fernald & Pease,* nos. 15,724, 15,728 and 15,729, September 3, 1917, *Fernald & Pease,* no. 15,666; damp alluvial thicket (by Connecticut River), Northumberland, July 18, 1917, *Fernald & Pease,* no. 15,722, September 3, 1917, *Fernald & Pease,* no. 15,784; boggy thickets and clearings, Lancaster, July 18, 1917, *Fernald & Pease,* no. 15,817; sandy roadside, Millsfield, September, 5, 1917, *Fernald & Pease,* no. 15,658; alluvial thicket by Androscoggin River, Errol, September 5, 1917, *Fernald & Pease,* no. 15,783; bushy swales and borders of woods, Randolph, July 18, 1917, *Fernald & Pease,* no. 15,733 (type in Herb. Gray), August 8, 1917, *Fernald & Pease,* no. 15,666. All distributed erroneously as *R. frondisentis* Blanchard.

Rubus tholiformis, identified by the late Ezra Brainerd as *R. frondisentis* Blanchard, is really very unlike that species in many characters. *R. frondisentis,* of southeastern Vermont and adjacent southwestern New Hampshire, is a stiffly erect species, with hard prickles, and leaves velvety beneath. *R. tholiformis,* separated from it by three-fifths the length of New Hampshire

and by the White Mountain system, has doming canes with tip-rooting branches, the primocanes densely covered with fine setae, the leaves quite glabrous except for the pilose nerves beneath. Superficially *R. tholiformis* suggests *R. aculiferus* of northern New Hampshire, *R. adenocaulis* of Nova Scotia and the following species of northern New Hampshire. *R. aculiferus* and *R. adenocaulis* have the leaves velvety-pilose beneath, the flowers large, with petals mostly 1.3–1.5 cm. long and 5–10 mm. broad. The primocanes of *R. aculiferus* have hard conic-subulate prickles and very few glands, and the petioles and petiolules are strongly prickly and essentially glandless; *R. tholiformis*, with glabrous foliage with heavily glandular and finely setose petioles and petiolules, and with small petals, really has little relationship to it. *R. adenocaulis* shares with *R. tholiformis* the densely glandular and short-setose primocanes but, as noted, its foliage is velvety-pilose beneath, its terminal primocane-leaflets are subcordate and on petiolules 2–4 cm. long (in *R. tholiformis* narrowed to slightly rounded to base and on petiolules only 1.2–2.4 cm. long), its raceme elongate instead of corymbiform, with strongly armed rachis, entire upper bracts, much larger petals and larger fruits. The many characters separating *R. tholiformis* from the following species will be considered in the discussion of that plant.

Rubus tholiformis is so abundant and characteristic in sandy or alluvial thickets, on sand plains or in sandy swamps of the upper Connecticut and upper Androscoggin systems north of and among the northern White Mountains that it should confidently be sought in Essex County, Vermont, Compton County, Quebec and Oxford County, Maine.

Plate 606, fig. 1, is a characteristic leaf of a primocane, × 1, from Stratford, Coös County, New Hampshire, *Fernald & Pease*, no. 15.728; fig. 2, junction of primocane-leaflets, × 5, from Stewartstown, New Hampshire, *Fernald & Pease*, no. 15.600; fig. 3, lower surface of primocane-foliage, × 10, from no. 15.728. In plate 607, fig. 1 is a flowering branch, × 1, from Stratford, *Fernald & Pease*, no. 15.729; fig. 2, flowers and pedicels, × 5, from no. 15,729; fig. 3, piece of primocane, × 3, from no. 15.728.

Rubus (Eubatus, § Tholiformes) **spiculosus,** sp. nov. (tab. 608 et 609), valde arcuans deinde depressis, cannis vel ramibus ad 2 m. longis apicibus prostratis rarissime radicantibus; primocannis 3–6 mm. diametro retrorso-setosis, setis ad 3 mm. longis discretis (100–500 per dm.), glandulis sparsis; primocannae foliis

Photo. H. G. Fernald.

RUBUS SPICULOSUS: FIG 1, characteristic primocane-leaflets, × 1; FIG. 2, summit of petiole and bases of leaflets, × 5; FIG. 3, portion of primocane, × 3.

Photo. H. G. Fernald.

RUBUS SPICULOSUS: FIG. 1, tip of flowering shoot, × 1; FIG. 2, calyx and pedicel, × 5.

quinatis firmis pallidis glabris petiolo 6–12 cm. longo sparse setoso vix glandulifero; foliolis elliptico- vel rhomboideo-ovatis longe acuminatis acute serratis costis subtus prominulis glabris vel glabrescentibus; foliolo terminali 7–14 cm. longo 3.5–8 cm. lato saepe subcordato petiolulo sparse setoso 1–3 cm. longo; floricannae foliis ternatis, foliolis anguste ovatis vel rhomboideo-obovatis acuminatis argute serratis; racemis laxis saepe subcorymbiformibus rhachi pilosi 3–8 cm. longi; bracteis lanceolatis saepe incisis; pedicellis laxe patentibus plerumque 2.5–5 cm. longis griseo-pilosis glanduliferis vix setosis; calycis pilosis saepe glandulosis lobis 6–7 mm. longis deinde reflexis; petalis anguste obovatis 1.2–1.5 cm. longis, 5–9 mm. latis; fructibus subglobosis 1.3 cm. diametro.—Northern and central New Hampshire: Coös County: wooded bank of Magalloway River, Errol, September 5, 1917, *Fernald & Pease*, no. 15,678; borders of dry woods near Mascot Pond, Gorham, *Fernald & Pease*, no. 15,659; borders of woods by the carriage road, Mount Washington, at 760 m., August 7, 1917, *Fernald & Pease*, no. 15,774. Grafton County: dry thickets and borders of woods, Lincoln, July 28, 1917, *Fernald*, nos. 15,707, 15,708, 15,795, 15,801, 15,802, 15,815 and 15,816, September 23, 1917, *Fernald*, no. 15,602; sandy roadsides and clearings, Johnson, Lincoln, August 25, 1917, *Fernald*, no. 15,676; borders of dry or wet woods or in alluvial thickets, North Woodstock, Woodstock, July 11, 1915, *Fernald*, no. 11,761; August 7, 1915, *Fernald*, no. 11,745, July 14, 1917, *Fernald*, no. 15,790 (also in Pl. Exsicc. Gray., no. 361), July 31, 1917, *Fernald*, no. 15,718; August 3, 1917, *Fernald*, no. 15,598, August 20, 1917, *Fernald*, no. 15,664, September 12, 1917, *Fernald*, no. 15,791, mature of no. 15,790 (also in Pl. Exsicc. Gray., nos. 362 and 363, primocane and fruit of no. 361); damp thickets, clearings and roadsides, Thornton Gore, Thornton, July 28, 1917, *Fernald*, no. 15,814, August 27, 1917, *Fernald*, no. 15,766 (type in Herb. Gray); dry thickets, clearings, swampy woods and roadsides, Plymouth, August 1, 1917, *Fernald*, nos. 15,595, 15,809 and 15,828. Belknap County: moist sandy thickets and borders of woods, Laconia, August 30, 1917, *Fernald*, no. 15,689; swampy thickets and damp borders of sandy woods, Gilford, no. 15,653. Specimens erroneously distributed as *R. multiformis* Blanchard or as "*R. canadensis* × *setosus*, fide Brainerd."

Just as *Rubus tholiformis* is the abundant pale-leaved and short-bristly doming or arching and finally tip-trailing species in the alluvial thickets and on terraces and sandy roadsides and sand plains of northernmost New Hampshire, so *R. spiculosus* is the superabundant species of similar habit in north-central New Hampshire, overlapping *R. tholiformis* only in eastern Coös

County, but dominating the sandy thickets of the Pemigewasset Valley. *R. tholiformis* has the grayish primocanes densely glandular and with almost innumerable horizontally divergent fine bristles only 1–2 mm. long; *R. spiculosus* has the primocanes greener and glabrous, with few or negligible glands and with scattered reflexed bristles mostly 3 mm. long. In *R. tholiformis* the foliage is chartaceous, with the prominent costae of the lower side strongly pilose; in *R. spiculosus* firmer, with the glabrous or glabrescent costae not specially prominent. In *R. tholiformis* the petioles and petiolules are heavily glandular, in *R. spiculosus* not. In *R. tholiformis* the subascending pedicels are 1–2 cm. long and more or less setose; in *R. spiculosus* the loosely divergent pedicels are mostly 2.5–5 cm. long and scarcely if ever setose. The petals of *R. tholiformis* are narrow, 3–4 mm. wide, and only 5–10 mm. long; in *R. spiculosus* they are showy, 5–9 mm. broad and 1.2–1.5 cm. long. In the silts and gravels of the Upper Connecticut where *R. tholiformis* abounds, lime is relatively abundant; in those of the Pemigewasset it is relatively deficient. These two superficially similar but really very distinct species well illustrate the localization of many species in the genus, many scores or hundreds of them yet to be worked out.

The identification of *Rubus spiculosus* with *R. multiformis* was unfortunate, for the latter species, although with a too catholic specific name, is quite glandless and its racemes are very prolonged. Brainerd's disposition of the many numbers of *R. spiculosus* as "*R. canadensis* × *setosus*" was an easy and ill considered verdict. The most accurate accounts of *R. canadensis* and *R. setosus* (in Bailey, Gent. Herb. ii. fasc. vi) correctly characterize the former as a "Tall upright smooth more or less glossy plant . . . Primocanes erect or upright-arching"; and *R. setosus* as an "erect or strongly ascending blackberry of low stature, . . . not tip-rooting." How, by crossing two species with erect habit constant offspring with long-arching and tip-rooting primocanes could be produced Brainerd did not attempt to explain; he was satisfied to assert that such was the source of *R. spiculosus*. Unfortunately, tentatively accepting his verdict, I long ago distributed all the duplicate material under the patently impossible identification supplied by him. In view of the extensive ranges of both *R. canadensis* (Newfoundland to

Photo. H. G. Fernald.

RUBUS ACULIFERUS: FIG. 1, characteristic primocane-leaflets, × 1; FIG. 2, lower surface of leaflet, × 10.

Photo. H. G. Fernald.

RUBUS ACULIFERUS: FIG. 1, portion of raceme, × 1; FIG. 2, calyx and pedicel, × 5; FIG. 3, portion of primocane, × 3.

Ontario, south to New England and New York and along the mountains to Georgia) and *R. setosus* (Newfoundland and Quebec to Wisconsin, south to Nova Scotia, New England and Pennsylvania) it would be most singular if they were, to use Bailey's phrase, "to spawn into mongrels" (and mongrels so unlike either parent), that this phenomenon should transpire only in north-central New Hampshire and that there the "mongrel" should be so constant and ubiquitous a species.

In PLATE 608, FIG. 1 is a portion of a typical leaf of a primocane, × 1, from Thornton, Grafton County, New Hampshire, *Fernald,* no. 15,814; FIG. 2, junction of primocane-leaflets, × 5, from 15,814; FIG. 3, portion of primocane, × 3, from no. 15,814. In PLATE 609, FIG. 1 is an inflorescence, × 1, from Woodstock, New Hampshire, *Fernald,* no. 11,761; FIG. 2 a flower-bud and pedicel, × 5, from no. 11,761.

RUBUS (EUBATUS, § THOLIFORMES) **aculiferus,** sp. nov. (TAB. 610 et 611), arcuans deinde depressus valde ramosus, cannis vel ramis ad 3 m. longis apice saepe radicantibus; primocannis 5–10 mm. diametro aculeatis glanduliferisque, aculeis conico-subulatis rectis numerosissimis; primocannae foliis quinatis submembranaceis subtus pilosis petiolo longo aculeato glanduliferoque, foliolis ovatis longe acuminatis anguste duplicato-serratis, foliolo terminali cordato 8–12 cm. longo 5–8 cm. lato petiolulo setoso 1.5–3.5 cm. longo; floricannae foliis ternatis, foliolis ovalibus vel obovatis grosse serratis; inflorescentiis corymbosis corymboso-racemosis vel cymosis rhachi pedicellis calycibusque villoso-tomentosis, rhachi sparse setoso nec aculeato; bracteis superioribus plerumque divisis; pedicellis plerumque 2–8 cm. longis divergentibus; calycibus villosis lobis 7 mm. longis; petalis elliptico-obovatis 1.5 cm. longis 6–10 mm. latis; fructibus subglobosis 1 cm. diametro.—Abundant in northern NEW HAMPSHIRE: Coös County: sandy roadsides and thickets, Stratford, July 18, 1917, *Fernald & Pease,* no. 15,715; damp alluvial thicket, Northumberland, July 18, 1917, *Fernald & Pease,* no. 15,716; dry fields, clearings and thickets, Shelburne, September 6, 1917, *Fernald & Pease,* no. 15,765. Grafton County: abundant in woods and thickets along Eastman Brook, Thornton Gore, Thornton, July 28, 1917, *Fernald,* no. 15,710 (TYPE in Herb. Gray), August 27, 1917, *Fernald,* no. 15,810 (fruit of no. 15,710); damp thicket, borders of woods and roadsides, 1/2 mile west of Russell Pond trail, Thornton Gore, Thornton, August 27, 1917, *Fernald,* no. 15,606; borders of dry woods and recent clearings, North Woodstock, Woodstock, July 8, 1917, *Fernald,* no. 15,786, also *Fernald* in Pl. Exsicc. Gray., no. 364, August 15, 1917, *Fernald,* no. 15,837 (fruit of no. 15,786), also *Fernald* in Pl. Exsicc. Gray., no. 366 (fruit of no. 364), August 20, 1917, *Fernald,* no. 15,617. All distributed incorrectly as *R. abbrevians* Blanchard.

Rubus aculiferus, like *R. adenocaulis*, has most singularly been called *R. abbrevians*. The latter, as explained in the discussion of *R. adenocaulis*, is a very low and stiffly erect plant, with no inclination to tip-rooting. *R. aculiferus*, however, is one of the most extreme of tip-rooting species. The young and simple primocanes are at first ascending and up to nearly 2 m. in height. They then branch and rebranch, quickly making an intricate dome of fiercely prickly stems. These arching canes and branches soon reach the ground and extensively trail, often reaching a length of 2 or 3 m. From the abundant *R. adenocaulis* of Nova Scotia, the equally abundant *R. aculiferus* of the White Mountain country differs in the very sparse glandularity of its primocanes, in the essentially glandless petiolules of the primocane-leaflets, in its more corymbose or loosely cymose inflorescence with merely setose rachis and with the upper bracts mostly deeply cleft, and in the very long and loosely spreading pedicels. Its fruit is of superior quality. Extending generally north to the international boundary, *R. aculiferus* is confidently to be sought in the Eastern Townships of Quebec and also in northeastern Vermont.

In PLATE 610, FIG. 1 is a portion of a typical primocane-leaf, × 1, from Woodstock, New Hampshire, *Fernald*, no. 15,837; FIG. 2, lower surface of leaf, × 10, from no. 15,837. In PLATE 611, FIG. 1 is a raceme, × 1, from Northumberland, New Hampshire, *Fernald & Pease*, no. 15,716; FIG. 2, a flower-bud and pedicel, × 5, from Woodstock, *Fernald*, no. 15,786; FIG. 3, portion of cane, × 3, from no. 15,837.

RUBUS (EUBATUS, § THOLIFORMES) **adenocaulis,** sp. nov. (TAB. 612–615), arcuans vel deinde procumbens valde ramosus, cannis vel ramis 1–2 m. longis saepe radicantibus; primocannis 5–8 mm. diametro densissime glanduliferis plus minusve aculeatis, aculeis rectis basi latis, glandulis saepe fasciculatis numerosissimis; primocannae foliis quinatis firmis subtus pilosis petiolo 4–12 cm. longo aculeato glanduliferoque, foliolis ovalibus vel ovatis vel ovali-obovatis acuminatis anguste duplicato-serratis, foliolo terminali cordato vel subcordato 5–9 cm. longo 3.5–8.5 cm. lato petiolulo glandulifero aculeatoque plerumque 2–4 cm. longo; floricannae foliis ternatis, foliolis anguste ovalibus acuminatis; racemis elongatis rhachi pedicellis calycibusque dense villosotomentosis, rachi valde armato; bracteis superioribus integris vel subintegris; pedicellis subadscendentibus 1–2 (–3) cm. longis; calycis lobis villosis 4–6 mm. longis; petalis ellipticoobovatis 1–1.4 cm. longis 5–10 mm. latis; fructibus globosoovoideis 1.5–2 cm. longis.—Southwestern NOVA SCOTIA: Yarmouth

Photo. H. G. Fernald.

RUBUS ADENOCAULIS: FIG. 1, portion of primocane and typical leaf, × 1; FIG. 2, lower surface of leaflet, × 10; FIG. 3, portion of primocane, × 3.

Photo. H. G. Fernald.

RUBUS ADENOCAULIS: FIG. 1, medium-sized inflorescence, × 1; FIG. 2, flower-buds and pedicels, × 5.

Co.: damp to dryish roadside thickets, Yarmouth, July 24, 1920, *Fernald, Bean & White,* no. 21,545; September 7, 1920, *Fernald, Long & Linder,* no. 21,557 (fruit of no. 21,545); rocky roadsides and borders of woods, Yarmouth, July 4, 1920, *Pease & Long,* no. 21,585 (TYPE in Herb. Gray); gravelly railroad bank, Tusket, July 21, 1921, *Fernald, Bartram, Long & Fassett,* no. 23,996; open rocky thicket near Vaughan (Tusket) Lake, Gavelton, August 13, 1921, *Fernald & Long,* no. 24,016; sphagnous thicket, Markland (Cape Forchu), July 13, 1921, *Fernald, Bartram, Long & Fassett,* no. 23,982; border of spruce swamp, Markland (Cape Forchu), August 22, 1921, *Fernald & Long,* no. 24,025 (fruit of no. 23,982); Glenwood, September 13, 1924, *J. G. Jack,* no. 3416. Shelburne County: rocky railroad bank, Wood Harbor, July 9, 1920, *Fernald, Bissell & Linder,* no. 21,616; gravelly railroad bank, Atwood Brook, July 14, 1921, *Bartram & Long,* no. 23,987; rocky thicket bordering Welchtown (Birchtown) Lake, August 2, 1921, *Fernald & Long,* no. 24,003; sandy railroad ballast, Shelburne, August 3, 1921, *Fernald & Long,* no. 24,008 (as *R. arcuans* Fern.); sandy railroad bank, Sable River, August 4, 1921, *Fernald & Long,* no. 24,011 (as *R. arcuans*). Most specimens erroneously distributed as *R. abbrevians* Blanchard.

Rubus adenocaulis is very different from *R. abbrevians;* only a desperate wish to place it somewhere accounts for its original identification (coupled with the fact that it superficially resembles the characteristic doming, arching and tip-rooting shrub of the White Mountains which Brainerd had erroneously referred to *R. abbrevians*). *R. abbrevians,* however, as its name signified, is a stiffly erect shrub only 3–6 dm. high, the canes slenderly bristly. It is the type of the very definite section *Abbreviantes* Bailey. In its doming and finally long-trailing canes *R. adenocaulis* belongs in the § *Tholiformes.* Its only close ally is the common White Mountain species which has also erroneously passed as *R. abbrevians.* In its more prostrate extreme *R. adenocaulis* might be mistaken for *R. biformispinus* Blanchard, a wide-ranging species, from Quebec to New York, south to Nova Scotia, southern New England and eastern Pennsylvania, but that species has the leaves glabrous on the lower face, leaflets of the floricanes blunt or merely acutish, the rachis of the raceme unarmed, the petals only 4–6 mm. broad.[1] The misidentification

[1] In view of the prolonged canes and the collection of the type by *Long & Pease,* it has been suggested that an appropriate specific name could be made by uniting their names by the conventional connective, *i.* The necessary distortion of spelling and the question of capital initials leads me to forego this intriguing possibility.

with *R. arcuans* was quite inexcusable, for that species has glabrous foliage with obovate primocane-leaflets, the terminal one abruptly short-tipped and with only 12–35 coarse teeth on each side; the ovate long-acuminate terminal leaflet of *R. adenocaulis* being soft-pubescent beneath and with 40–50 fine serrations on each margin.

In PLATE 612, FIG. 1 is a portion of primocane and a leaf, × 1, from the TYPE, Yarmouth, Nova Scotia, *Pease & Long,* no. 21,585; FIG. 2, lower leaf-surface, × 10, from TYPE; FIG. 3, portion of cane, × 3, from Shelburne, Nova Scotia, *Fernald & Long,* no. 24,008. In PLATE 613, FIG. 1 is a medium-sized inflorescence, × 1, from the TYPE; FIG. 2, flower-buds and pedicels, × 5, from the TYPE. PLATE 614 is a larger inflorescence, × 1, borne on sprout-growth, from Sable River, Nova Scotia, *Fernald & Long,* no. 24,011. PLATE 615 is a fruiting branch, × 1, from Gavelton, Nova Scotia, *Fernald & Long,* no. 24,016.

RUBUS (EUBATUS, § THOLIFORMES) **adjacens,** sp. nov. (TAB. 616–618) arcuans vel deinde procumbens, cannis ad 2.5 m. longis, 3–8 mm. crassis; primocannis tholos formantibus apice liberis vel radicantibus densissime retroso-setosis plus minusve glandulosis, setis purpurascentibus vel coloratis valde imbricatis (3000–5000 per dm.); primocannae foliis coriaceis atroviridibus lucidis glabris quinatis vel ternatis petiolo 6–12 cm. longo setoso glanduliferoque, foliolis obovatis vel rhomboideis abrupte breviterque acuminatis serrato-dentatis, foliolo terminali rhomboideo-obovatis basi rotundo-subcuneato 4–8 cm. longo 2.5–5 cm. lato petiolulo piloso setifero glanduloque 0.5–1.8 cm. longo; floricannae foliis ternatis; foliolis anguste cuneato-obovatis subcoriaceis acutis vel subacutis, acute serratis; inflorescentiis corymbiformis corymbiformi-racemosis vel cymosis rhachi pedicellis calycibusque pilosis plus minusve armatis glanduliferisque; bracteis mediis lanceolatis simplicibus vel incisis; pedicellis arcuato-adscendentibus plerumque 1.5–2.5 cm. longis; calycis lobis plus minusve glanduloso-setosis 2.7–5 (–6) mm. longis; petalis anguste oblanceolatis 7–12 mm. longis 2–5 mm. latis; fructibus subglobosis ca. 1 cm. diametro.—Quebec to Nova Scotia, Maine and Massachusetts. QUEBEC: woods, vicinity of St. Jerome, Laurentide Mountains, July 8, 1920, *Victorin,* no 11,233. NEW BRUNSWICK: low land, Shediac Cape, July 27, 1914, *F. T. Hubbard;* railroad embankment, Ingleside, Westfield, Kings County, August 8, 1909, *Fernald & Wiegand.* NOVA SCOTIA: Lunenburg County: rocky thickets and woods, bordering Big Mushamush Lake, August 17, 1921, *Fernald & Long,* no. 24,024. Digby County: boggy thickets, Sandy Cove, August 28, 1921, *Fernald & Long,* no. 24,030; sandy roadsides, Weymouth, August 8, 1921, *Fernald & Long,* no. 24,012; moist thickets, Meteghan, July 7, 1920, *Fernald & Long,* no. 21,551. Shelburne County: gravelly railroad bank, Atwood

Photo. H. G. Fernald.

RUBUS ADENOCAULIS: tip of vigorous flowering sprout, × 1.

Photo. H. G. Fernald.

RUBUS ADENOCAULIS: fruiting racemes, × 1.

Brook, July 14, 1921, *Bartram & Long,* no. 23,988; dry rocky and gravelly slopes, Shag Harbor, July 9, 1920, *Fernald, Bissell & Linder,* no. 21,630. Yarmouth County: dry gravelly railroad embankment, Arcadia, July 12, 1920, *Pease & Long,* no. 21,542; damp to dryish roadside thickets, Yarmouth, July 24, 1920, *Fernald, Bean & White,* no. 21,546; gravelly railroad embankment, Yarmouth, September 7, 1920, *Fernald, Long & Linder,* no. 21,558; rocky and gravelly woods and thickets bordering Cedar Lake, July 11, 1920, *Fernald, Bissell, Pease, Long & Linder,* no. 21,599; gravelly thicket, Lower Argyle, August 11, 1920, *Fernald, Bissell, Graves, Long & Linder,* no. 21,619; sphagnous thicket, Markland (Cape Forchu), July 13, 1921, *Fernald, Bartram, Long & Fassett,* no. 23,983; rocky and cobbly border of Lake George, July 16, 1921, *Fernald & Fassett,* no. 23,992. Maine: dry soil, Pembroke, July 24, 1909, *Fernald & Wiegand;* border of moist woods and thickets, Lyman, August 10, 1916, *Fernald & Long,* no. 13,902; west road to West Kennebunk, Kennebunk, July 12, 1905, *Blanchard* (as *R. hispidus,* var. *major*). New Hampshire: Coös County: boggy thickets and woods near Gorham, August 9, 1917, *Fernald & Pease,* no. 15,805. Grafton County: thickets, clearings and borders of woods, Lincoln, August 13, 1917, *Fernald,* no. 15,601, July 28, 1917, *Fernald,* nos. 15,706 and 15,719, August 23, 1917, *Fernald,* no. 15,838; dry or moist thickets or clearings, North Woodstock, Woodstock, August 7, 1915, *Fernald,* nos. 11,762, 11,764 and 11,767, July 6, 1915, *Fernald,* no. 11,779, August 20, 1917, *Fernald,* no. 15,614 (type in Herb. Gray), July 14, 1917, *Fernald,* no. 15,750 (also in Pl. Exsicc. Gray., no. 367), August 22, 1917, *Fernald,* no. 15,751, fruit of no. 15,752 (also in Pl. Exsicc. Gray., nos. 368 and 369, primocane and fruit of no. 367), August 20, 1917, *Fernald,* no. 15,811; damp thickets and borders of woods, Thornton Gore, Thornton, August 27, 1917, *Fernald,* no. 15,609, 15,772 and 15,773. Belknap County: swampy thicket and damp border of sandy woods, Gilford, August 30, 1917, *Fernald,* no. 15,775. Vermont: Ripton, August 19–21, 1903, *Eggleston,* no. 3241, as *R. hispidus* × *setosus.* Massachusetts: gravelly railroad bank, Concord, October 24, 1897, *W. P. Rich.* Mostly distributed erroneously as *R. jacens* Blanchard.

Rubus adjacens has passed generally as *R. jacens* Blanchard; some specimens have been identified as *R. hispidus* Michx. (var. *major* Blanchard). True *R. jacens,* however, is a relatively slender trailer with thin and pale green chartaceous primocane-foliage with lateral ribs impressed above and prominent beneath, the leaflets oblong-ovate and long-acuminate, and calyx mostly

without glands. It occurs in relatively warm areas, the type-region, Alstead, New Hampshire, along the Connecticut River, being an area with many southern trees and shrubs (*Carya spp., Castanea dentata, Quercus ilicifolia* and *prinoides, Sassafras albidum, Xanthoxylum americanum, Acer nigrum, Ceanothus americanus, Rhododendron roseum* and *Lonicera dioica*). It is clearly of the § *Hispidi*. *R. adjacens* is a relatively coarse species, the heavy primocanes doming, but finally becoming depressed. The material from northern New Hampshire was cited by Brainerd & Peiterson under *R. jacens* (as *R. hispidus* × *setosus*) and the error has been continued by others. It is one of the northernmost species, having its great development in western Nova Scotia, in the area of spruce forest, and in the White Mountain region, quite outside the limits of *Carya* and *Sassafras*. *R. adjacens* has coriaceous and lustrous primocane-foliage somewhat suggesting that of typical *R. hispidus* Michaux, but that has more truly evergreen leaves, with round-tipped or obtuse blunt-toothed leaflets, the floricane-leaflets firmer and obtuse, the pedicels only minutely (instead of strongly) pilose, the calyx mostly glandless, and the soon completely trailing primocanes bear only 200–2000 (in var. *obovalis* only 0–200) bristles and glands per decimeter (against 3000–5000 in the thinner-leaved, more arching *R. adjacens*, which has acute leaflets with sharp teeth, the calyx strongly glandular). In the very copious and overlapping bristles *R. adjacens* suggests *R. permixtus* Blanchard, but the indument of the primocane in *R. permixtus* is soft and plush-like (not stiffish), the leaflets pale and velvety to the touch beneath (not dark green, coriaceous and glabrous). *R. adjacens* likewise suggests some forms of *R. trifrons*, but its much coarser and more doming canes with 3000–5000 coarse and overlapping bristles (against a more slender habit and fewer—100–500—setae) per dm., its more coriaceous foliage and its later flowering and fruiting in the same areas, set it apart. It is as late as *R. tardatus* Blanchard but that poorly understood species has the slender canes with strong prickles and few if any setae and the primocane-foliage paler and more membranaceous, with longer-tapering strong-ribbed leaflets.

Photo. H. G. Fernald.

RUBUS ADJACENS: FIG. 1, portion of primocane, with characteristic foliage, × 1; FIG. 2, summit of petiole and bases of leaflets, × 5; FIG. 3, portion of primocane, × 3.

Photo. H. G. Fernald.

RUBUS ADJACENS: FIG. 1, flowering branches, × 1; FIG. 2, calyx and pedicels, × 5.

In PLATE 616, FIG. 1 is a portion of primocane with foliage, × 1, from the TYPE, Woodstock, New Hampshire, *Fernald,* no. 15,614; FIG. 2, junction of primocane-leaflets, × 5, from Woodstock, *Fernald,* no. 11,767; FIG. 3, portion of cane, × 3, from no. 11,767. In PLATE 617, FIG. 1 is a flowering branch, × 1, from Woodstock, *Fernald* in Pl. Exsicc. Gray., no. 367; FIG. 2, a calyx and pedicels, × 5, from no. 367. PLATE 618 shows fruiting racemes, × 1, from Thornton, New Hampshire, *Fernald,* no. 15,772.

RUBUS (EUBATUS, § THOLIFORMES) **bracteoliferus,** sp. nov. (TAB. 619 et 620), valde arcuans cannis tholos altos formantibus; primocannis valde elongatis 6–10 mm. diametro, apice radicantibus dense armatis, aculeis conico-subulatis setis glandulisque numerosissimis; primocannae foliis quinatis subtus subvelutinis, petiolo 1–1.3 dm. longo aculeato glanduliferoque, foliolis ovatis longe acuminatis duplicato-serratis, foliolo terminali cordato 1.2 dm. longo 7–8 cm. lato petiolulo glandulifero aculeatoque 3.5–4.3 cm. longo; floricanne foliis ternatis vel subquinatis, foliolis late ovatis acuminatis; racemis laxis rhachi 4–11 cm. longo sparse piloso plus minusve armato glanduliferoque; bracteis imis foliaceis ovatis acuminatis, superioribus valde reductis lanceolatis; pedicellis 7–12 arcuato-adscendentibus 2–4 cm. longis, glanduliferis aculeatisque, imis 3–6 bracteolas imbricatas gerentibus; calycis dorso breviter pilosis vel glabrescentibus glanduloso-setosis, lobis 7–10 mm. longis; fructibus subglobosis 1.5 cm. diametro.—NEW YORK: abundant in damp thicket back of dry sand dunes (overlying Silurian limestone) by Lake Ontario, northwest corner of Sandy Creek Township, Oswego County, August 25, 1922, *Fernald, Wiegand & Eames,* no. 14,337, distributed as *R. glandicaulis* Blanchard (TYPE in Herb. Gray).

Rubus bracteoliferus apparently belongs in the group of northern species constituting § *Tholiformes.* Its doming canes and tip-rooting habit place it there. In foliage it is very close to *R. Boyntoni* Ashe of the southern Appalachians, but its very copious armature of prickles, bristles and glands (many hundreds to a decimeter of typical primocane) and the elongate and more open racemes with much larger and acuminate lower bracts quickly distinguish it. It is really not very close to *R. glandicaulis,* that species having the upright canes of § *Allegheniense.*

In PLATE 619, FIG. 1 is a portion of primocane, with leaf, × 1/2; FIG. 2, portion of primocane, × 3. PLATE 620 shows two fruiting racemes, × 1. All from the TYPE, from Stony Creek Township, Oswego County, New York, *Fernald, Wiegand & Eames,* no. 14,337.

RUBUS (EUBATUS, § THOLIFORMES) **paludivagus,** sp. nov. (TAB. 621 et 622), arcuans valde ramosus, cannis tholos formantibus, cannis ramisque apicibus saepe radicantibus; primocannis simplicibus deinde intricate ramosis 3–6 mm. diametro juvenilibus

puberulis deinde glabratis armatis; aculeis rectis subulatis 5 mm. longis basi 2–3 mm. latis; primocannae foliis quinatis firmis vel submembranaceis supra strigoso-pilosis, subtus subvelutinis griseis; foliolis oblongis vel anguste lanceolato-ovatis duplicato serratis acuminatis basi angustis vel subrotundatis, foliolo terminali 7–8 cm. longis 2.5–3.7 cm. latis petiolulo armato 1–1.7 cm. longo; floricannae foliis ternatis membranaceis foliolis ellipticolanceolatis, -oblanceolatis vel anguste ovatis acuminatis; racemis laxis rhachi plerumque 4–11 cm. longo sparse piloso; bracteis plerumque trifidis 4–8 mm. longis; pedicellis laxe adscendentibus pilosis plus minusve aculeatis plerumque 1.5–3 (–5) cm. longis ebracteolatis; calycis pilosis inarmatis lobis 3–5 mm. longis vix reflexis; petalis elliptico-obovatis 1–1.5 cm. longis, 6–7 mm. latis; fructibus pergratis 1.5 cm. diametro.—Barnstable County, Massachusetts: damp thickets bordering cranberry bogs, Harwich, June 26, 1918, *Fernald,* nos. 16,909 and 16,923; moist thicket along Doane Creek, Harwichport, Harwich, August 13, 1918, *Fernald & Long,* no. 16,910; damp thickets on dikes by cranberry bogs, east of Slough Road, Harwich, August 18, 1918, *Fernald & Long,* no. 16,924 (type in Herb. Gray.); all erroneously distributed as *R. argutus* Link.

Rubus paludivagus, characteristic of the wet margins of cranberry bogs on Cape Cod, really has little to do with *R. argutus,* although its leaves are quite similar to those of *R. argutus* as shown by Bailey, Gent. Herb. i. fasc. iv. fig. 84, p. 187 (1923). Bailey there and in Gent. Herb. ii. fasc. iv. 388, figs. 168 and 169 (1932)[1] identifies *R. argutus* as a southern erect or high-climbing species, with which I am very familiar in eastern Virginia. Its short corymbiform raceme is very leafy, the rachis, short pedicels and large calyx densely villous, the calyx-lobes promptly reflexed. It belongs in § *Arguti,* whereas *R. paludivagus* is a low-arching and tip-rooting species.

In plate 621, fig. 1 is a portion of primocane, with leaf, × 1, from the type, Harwich, Massachusetts, *Fernald & Long,* no. 16,924; fig. 2, lower leaf-surface, × 10, from the type; fig. 3, fruiting raceme, × 1, from the type. In plate 622, fig. 1 is a flowering raceme, × 1, from Harwich, *Fernald,* no. 16,909; fig. 2, portion of flowering cane, × 1, from Harwich, *Fernald,* no. 16,923; fig. 3, calyx and pedicel, × 5, from no. 16,923.

[1] I have elsewhere commented on the advantages of receiving credit for absent-treatment performances.—See Science, lxxxix. 329 (1939). Bailey, op. cit. 391, states that, "In 1897 I photographed these sheets in Berlin, and pictures have been taken by Fernald (see figs. 84, 127, Gent. Herb. i)". Unfortunately, to the best of my recollection, I have never visited Berlin nor have I examined Link's type. A tracing of it, made by Dr. J. M. Greenman, December 19, 1899, is in the Gray Herbarium. It is presumably this which Bailey had in mind.

Photo. H. G. Fernald.

RUBUS ADJACENS: fruiting racemes, × 1.

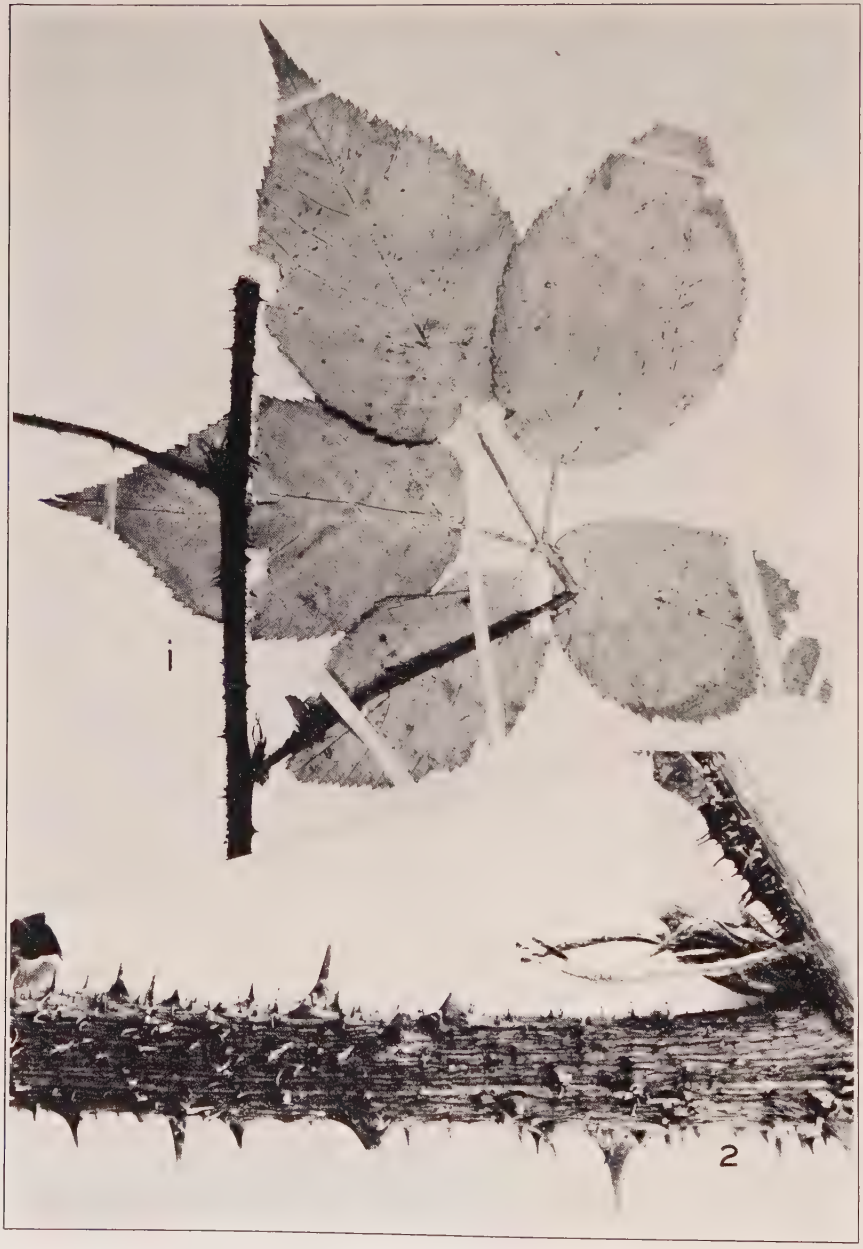

Photo. H. G. Fernald.

RUBUS BRACTEOLIFERUS: FIG. 1, portion of primocane and a primocane-leaf, × ½; FIG. 2, portion of primocane, × 3.

Rubus **laevior** (Bailey), stat. nov. *R. permixtus,* var. *laevior* Bailey, Gentes Herbarium, ii. 348 (1932).

Rubus laevior, occurring at the base of Cape Cod, differs in so many characters from *R. permixtus* Blanchard, found from southwestern Maine across New Hampshire and Vermont to central New York and originally described from the Connecticut Valley, that I find them quite as different as the other local species of the genus. The contrasts follow:

R. permixtus. Primocanes with 1000–5000 soft purple hairs and gland-tipped bristles with few prickles intermixed on a dm. of young growth; leaflets of primocane-foliage rhombic-ovate to obovate, abruptly short-pointed, the terminal ones 2.5–6.5 cm. long, and on heavily glandular petiolules only 0.7–2 cm. long; inflorescence an elongate raceme, the rachis, pedicels and calices villous-tomentose; bladeless bracts mostly lobed or cleft, lanceolate, elliptic or oval.

R. laevior. Primocanes with fewer and paler prickles and glands; leaflets of primocanes more gradually acuminate, the terminal ones 6–9 cm. long and on glandless or very sparsely glandular petiolules 2.3–3.5 cm. long; inflorescence a short corymbiform raceme or open cyme, the rachis, pedicels and calices minutely pilose to glabrescent; bladeless bracts linear-lanceolate, entire.

Centella **erecta** (L. f.), comb. nov. *Hydrocotyle erecta* L. f. Suppl. 177 (1781). *H. reniformis* Walt. Fl. Carol. 113 (1788). *H. ficarioides* Michx. Fl. Bor.-Am. i. 161 (1803), not Lam. (1789). *H. repanda* Pers. Syn. i. 202 (1805). *Glyceria repanda* (Pers.) Nutt. Gen. i. 177 (1818). *Chondrocarpus repandus* (Pers.) by implication only, though ascribed by later authors as a binomial to Nutt. Gen. ii. Errata (1818). *Chondrocarpus erectus* (L. f.) Nutt. ex Wats. Bibl. Index, 425 (1878), as error for Nuttall's merely implied *C. repandus. H. asiatica* sensu Coult. & Rose, Revis. N. Am. Umb. 136 (1888), not L. (1753). *H. asiatica,* var. *Floridana* Coult. & Rose, l. c. (1888). *Centella asiatica* sensu Coult. & Rose in Contrib. U. S. Nat. Herb. vii. 30 (1900), not (L.) Urban (1879). *Cent. asiatica floridana* (Coult. & Rose) Coult. & Rose, l. c. (1900). *Cent. repanda* (Pers.) Small, Fl. Se. U. S. 859, 1336 (1903). *Cent. repanda floridana* (Coult. & Rose) Small, Fl. Se. U. S. l. c. (1903). *C. floridana* (Coult. & Rose) Nannfeldt in Svensk Bot. Tidskrift, xviii. 411 (1924).

Centella erecta, recently generally known as *C. repanda,* was clearly described by Linnaeus filius from Jamaica. It is the only member of the genus known from that and adjacent West Indian Islands, Fawcett & Rendle citing only the one species, as *Hydrocotyle asiatica.* The younger Linnaeus had dwarf plants

"foliis cordatis crenatis, scapis paucifloris longitudine petiolorum", but plenty of West Indian specimens also show prolonged petioles, Jamaican material, coll. by *March* in 1858, showing them 2 dm. long and many times overtopping the scapes. Walter's *Hydrocotyle reniformis* (1788) was beautifully described, with the generic and specific characters emphasized: "foliis reniformibus, dentatis, erectis. Scapis, 2, 3^{ve} 1, 2, 3^{ve} floris, involucro diphyllo", and by Watson's Bibliographic Index and by Index Kewensis it is clearly made synonymous with the later *H. repanda* Pers. (1805). Walter's trivial name was quite available, though seven years later than that of Linnaeus filius, when the Persoon name was perpetuated and finally placed under *Centella*.

The plant varies greatly in stature in response to the simplest of edaphic factors. When it grows on open mud, without shade, its creeping stems hug the ground and the clusters of leaves will be crowded, with petioles down to 2.5–0.5 cm. long, with blades, naturally, reduced in area (down to 2.5–1.5 cm. long) and increased in thickness. When it grows among tall vegetation the loosely ascending petioles extend up to 1–3 dm. in length and the blades increase in size (up to 4–8 cm. long) and become relatively thin (as in most herbs under parallel conditions). Upon this difference and an implied difference in the size of fruit Coulter & Rose attempted to differentiate *C. "asiatica,"* including *Hydrocotyle repanda* Pers., with petioles "7.5–10 cm. or even 30 cm. long" and growing from "Maryland to Florida and west to Texas"; and *C. asiatica,* var. *floridana,* "Petioles 2.5 cm. long or less, making the leaves appear in rather close clusters along the rootstock, more or less pubescent; fruit somewhat larger and more or less pubscent," this short-petioled series occurring in "Florida; also in the West Indies and Central America"; the TYPE being *A. H. Curtiss,* no. 988, from near Jacksonville, Florida (in herb. Coulter). Fortunately or unfortunately, the sheet of *Curtiss,* no. 988 which came to the Gray Herbarium contains both developments of the plant; a tuft with petioles up to 2 dm. high and blades up to 5.5 cm. long, and a repent strand with short petioles and small blades. Similarly in the West Indies both extremes and all kinds of transitions

Photo. H. G. Fernald.

RUBUS BRACTEOLIFERUS: FIGS. 1 and 2, fruiting racemes, × 1.

Photo. H. G. Fernald.

RUBUS PALUDIVAGUS: FIG. 1, portion of primocane and characteristic primocane-leaf, × 1; FIG. 2, lower surface of leaflet, × 10; FIG. 8, fruiting raceme, × 1.

occur, a Jamaican sheet showing, as already noted, petioles 2 dm. long. In our experiences in Virginia the largest and smallest extremes prove to be mere responses to light and moisture. Small, who was not averse to habit-species, went no farther than Coulter & Rose, but Nannfeldt, finding what seemed to him differences in size and proportions of fruits, treated these plants as two species, *C. repanda* and *C. floridana*. Unfortunately he rather reversed the ranges given by Coulter & Rose, citing *C. repanda* only from the West Indies to Texas, and north to South Carolina; while "**C. floridana** (C. et R.) Nannf. n. sp.", with "Spec. orig.: Purpus Nr. 5237 [from San Luis Potosí, Mexico]" was described "Planta robusta . . . Petioli . . . usque ad 15 cm. longa" and specimens were cited from north through eastern Virginia into Maryland. In other words, Nannfeldt, although deriving his specific epithet from Coulter & Rose, applied it largely to the plant which they excluded from their *C. asiatica* var. *floridana*. This difference arose through Nannfeldt's feeling that the Maryland and Virginia material had fruits somewhat broader, "4.5–5.0 mm." broad, while his *C. repanda* should have them "3.5–4.0 mm." broad. I have tried this character and get no satisfaction from it. Nannfeldt states that his description of the fruit of *C. repanda* was made from a Lindheimer specimen from Texas, from at least 800 miles away from the TYPE region in eastern South Carolina. His description of the fruit of his *C. floridana* was made, not from the Jacksonville TYPE, but from a specimen from San Luis Potosí, more than 1100 miles from Jacksonville and in a very different vegetational area. The Purpus plant, as represented in the Gray Herbarium, does have some fruits nearly 5 mm. broad; the TYPE number of *C. floridana* (*Curtiss*, no. 988) shows, in the Gray Herbarium sheet, fruits down to 3.5 mm. broad. The futility of struggling to recognize two species here is evident.

A word should be said regarding *Hydrocotyle cordata* Walt. Fl. Carol. 113 (1788). This name occasionally appears, with indication of doubt, in synonymy of *Centella erecta*. Walter had four species under *Hydrocotyle* and I am under obligation to my friend Ramsbottom for a very clear photograph of the four as represented in the Walter herbarium at the British

Museum. *H. umbellata* L. and *H. americana* L. were correctly described and are represented by characteristic specimens. *H. reniformis* Walt. was clearly described, with the generic characters of *Centella* and the tuft of long-petioled leaves was annotated (apparently by the late Keeper, James Britten) "*H. asiatica* (*repanda*)". Returning to *H. cordata*, described merely "foliis cordatis integris erectis", the specimen is a single characteristic leaf, correctly identified in the same hand as the last, "*Limnanthemum trachyspermum.*" Walter's *Hydrocotyle cordata* long antedated *Villarsia cordata* Ell., basis of *Nymphoides cordatum* (Ell.) Fernald in Rhodora, xl. 338 (1938). The latter name, under *Nymphoides*, cannot now be changed. *Hydrocotyle cordata* Walt., being of the same date and published in the identical volume with *Anonymus aquatica* Walt., cannot disturb the name *Nymphoides aquatica* (Walt.) Ktze. for the coarse southern species.

Zizia **trifoliata** (Michx.), comb. nov. *Sison trifoliatum* Michx. Fl. Bor.-Am. i. 168 (1803). *Z. aurea*, var. *Bebbii* Coult. & Rose in Bot. Gaz. xii. 138 (1887). *Z. Bebbii* (Coult. & Rose) Britton in Mem. Torr. Bot. Cl. ii. 35 (1890).

In view of the similarity of various species of *Zizia* and of *Thaspium* in the flowering condition it is most regrettable that the rule of priority of specific epithets forces upon a species of *Zizia* the specific epithet *trifoliata* when there is also a *Thaspium trifoliatum* (L.) Gray. Fortunately, however, the two species are quite dissimilar in appearance in the flowering condition. They will not be confused in fruit and foliage. *Sison trifoliatum* Michx. was from the high mountains of Carolina. That it is the plant generally known as *Z. Bebbii* will be clear from the photograph of the type, × ½ (our plate 623, fig. 1). Fig. 2 is a portion, × ½, of characteristic *Z. Bebbii* from Warm Springs, Georgia, *Tracy*, no. 8917.

Breweria **patens** (Desr.), comb. nov. *Convolvulus patens* Desr. in Lam. Encycl. iii. 547 (1789).

Breweria patens has been generally confused with *B. trichosanthes* (Michx.) Small. The latter species, resting nomenclaturally on *Convolvulus trichosanthes* Michx. Fl. Bor.-Am. i. 137 (1803), was described as having fascicles of 1–5 flowers, but

Photo. H. G. Fernald.

RUBUS PALUDIVAGUS: FIG. 1, branches of vigorous floricane, × 1; FIG. 2, portion of typical floricane, × 1; FIG. 3, calyx and pedicel, × 5.

Photo. H. G. Fernald.

ZIZIA TRIFOLIATA: FIG. 1, TYPE, × ½, of *Sison trifoliatum* Michx.; FIG. 2, characteristic plant, × ½, of *Zizia Bebbii* (Coult. & Rose) Britton.

the type shows all the peduncles with 3–5 flowers and is a good match for extremely large specimens of *B. aquatica* (Walt.) Gray. Desrousseaux beautifully described the very slender plant of sandy pine barrens and openings from North Carolina to northwestern Florida (our PLATE 624), with widely divergent 1-flowered peduncles and linear leaves. His material, sent by Fraser from Carolina, was characterized: *"Convolvulus filiformis suberectis foliis linearibus, mucronatis; pedunculis patentissimis folio longioribus"* and his fuller account emphasized the obtuse leaves about 1 inch long and 2 lines broad, solitary flowers on horizontally divergent peduncles with 2 oval to lanceolate bracts at summit, the sepals oval and pointed. That it is not the *Convolvulus trichosanthes* Michx. (= *Breweria aquatica*) is clear from PLATE 624, FIG. 1, showing a portion, × ½, of Desrousseaux's type. FIG. 2 is from a plant, × 1, from Liberty County, Georgia, *Wiegand & Manning,* no. 2632.

The following specimens are referred to *B. patens.* NORTH CAROLINA: dry open pine woods, 2 miles south of Pinebluff, Moore Co., *Wiegand & Manning,* no. 2631; sandhill, 12 miles north of Laurinburg, Scotland Co., *Godfrey,* no. 5047; sand-ridge at Carolina Beach, New Hanover Co., *Godfrey,* no. 4705; sand-ridge, 5 miles west of Clinton, Sampson Co., *Godfrey,* no. 4495. CAROLINA: without designation of locality, FRAZER, TYPE (see PLATE 624). GEORGIA: sandy roadside, 4 miles southwest of Hinesville, Liberty Co., *Wiegand & Manning,* no. 2632; sandy soil near Augusta, *Biltmore Herb.* no. 14953[d]. FLORIDA: dry pine barrens, De Funiak Springs, *A. H. Curtiss,* no. 5903 (distrib. as *Evolvulus sericeus* Sw.); De Funiak, *Tracy,* no. 9198.

HOUSTONIA **nigricans** (Lam.), comb. nov. *Gentiana nigricans* Lam. Encycl. ii. 645 (1786). *Houstonia angustifolia* Michx. Fl. Bor.-Am. i. 85 (1803).

The heretofore problematic *Gentiana nigricans* was described with "fleurs . . petites, purpurines ou bleuâtre, nombreuses, & disposée au sommet de la plante en cîme corymbiforme. Leur limbe est quadrifide & un peu pubescent à l'interieur." Lamarck had his doubts about it and really suspected the true generic affinity, commenting, "Il faudra peut-être la ranger parmi les *Houstonia,* avec lesquelles il paroît qu'elle a des rapports." PLATE 625, FIGS. 1 and 2 are the two plants, × 1, of the TYPE of *Gentiana nigricans;* FIG. 3 is a similar portion of *Houstonia*

angustifolia from Georgia, *Boykin,* near the type region of Michaux's species. That they are the same no one is likely to question.

Lactuca **biennis** (Moench), comb. nov. *Sonchus biennis* Moench, Meth. 545 (1794). *S. racemosus* Lam. Encycl. iii. 400 (1789), not *L. racemosa* Willd. Sp. Pl. iii. 1524 (1804). *Sonchus leucophaeus* Willd. Sp. Pl. iii. 1520 (1804) as to plant described but excluding synonyms *S. spicatus* Lam. and *Prenanthes autumnalis* Walt. *Mulgedium leucophaeum* Willd. DC. Prodr. vii². 250 (1838). *L. leucophaea* (Willd.) Gray in Proc. Am. Acad. xix. 73 (1883), not Sibth. (1833). *L. spicata* sensu Hitchc. ex Britt. & Brown, Ill. Fl. iii. 276 (1898), not *Sonchus spicatus* Lam. Encycl. iii. 401 (1789), basinym.

It is most difficult to understand how *Lactuca biennis,* the erect large-leaved plant with thyrsoid-paniculate inflorescence of erect heads with pale- or dirty-bluish to whitish ligules should have been confused with the beautifully described *Sonchus spicatus* Lam., with the diagnosis "*Sonchus pedunculatis squamatis nutantibus, spica longissima virgata, foliis runcinatis*" and with the full account of this "Nouvelle espèce très-distinguée de toutes les autres par la disposition de ses fleurs. Sa tige est haute de deux à trois pieds, très-simple . . . feuilles . . roncinées . . les supérieures sont fort étroites, linéaires-lancéolées, entières, plus petites que les autres. Les fleurs sont purpurines, penchées ou même pendantes . . & disposées en un épi effilé, très-long, & terminal . . . Cette espèce a été trouvée dans la Caroline méridionale par M. Fraser, qui nous l'a communiquée". Lamarck clearly described *Prenanthes autumnalis* Walt.; in fact he cited Walter's species as a probable synonym! Incidentally, Fraser could not have missed *Prenanthes autumnalis* in South Carolina; he could hardly have found *Lactuca biennis* there. Small gives the southern limit as in North Carolina, and the only specimens from that state are from the Blue Ridge counties. Lamarck was familiar with our plant. He clearly described it, with pyramidal panicle and with the sessile pappus russet, as *Sonchus racemosus.* The photograph of his type is perfectly characteristic; but unfortunately there is already a *Lactuca racemosa!* The identity of *Sonchus spicatus* is so apparent from Lamarck's lucid account that, since noting the error of identifying the coarse *Lactuca* with it, I have merely waited until I could get

Photo. H. G. Fernald.

Breweria patens: fig. 1, type, × ½, of *Convolvulus patens* Desr.; fig. 2, flowering plant, × 1, of *Breweria trichosanthes* sensu Small, not *Convolvulus trichosanthes* Michx.

Photo. H. G. Fernald.

HOUSTONIA NIGRICANS: FIGS. 1 and 2, TYPE of *Gentiana nigricans* Lam., × ½; FIG. 3, characteristic branch of *Houstonia angustifolia* Michx, × ½, from Georgia.

a photograph of Lamarck's type before attempting to clarify the situation. The photograph of the type of *Sonchus spicatus*, received through the coöperation of Professor Humbert and Messrs. Metman and Cintract,[1] is conclusive; the clarification is only tentative.

The identity of the many North American plants described in the 18th and early years of the 19th centuries by European authors under *Lactuca, Sonchus* and *Mulgedium* are quite impossible to decipher from the meager descriptions alone. Yet, until they can be painstakingly studied, with fully representative American specimens for comparison, we can only take the statements of others regarding them. In modern would-be exact taxonomy no saying is more true than "you can trust nobody". In the present instance the untrustworthiness of past identifications is patent. The confusion seems to have started with the great and almost unexcelled scholar, A. P. DeCandolle, who, correctly describing *Mulgedium leucophaeum* (Willd.) DC. Prodr. vii[2]. 250 (1838), "caule erecto glabro apice paniculato, . . . paniculae ramis racemosis . . . Capitula . . juniores albi demùm coerulescentes", cited *Sonchus spicatus* as a synonym but with the comment: "Nomen Lamarckii etiamsi vetustius sed falsum omisi". Starting with DeCandolle, the misidentification of *S. spicatus* has stood uncorrected for more than a century. Asa Gray, calling the coarse species of *Lactuca, L. leucophaea*, wrote in 1883, "The large synonymy of this species may be still further extended; for it must be the *S. racemosus* as well as *S. spicatus* of Lamarck, *S. biennis* of Moench, and it may also be *S. multiflorus* Desf."—Gray, Proc. Am. Acad. xix. 73 (1883). These with other synonyms and "*sensu*" names appeared under *L. leucophaea* (Willd.) Gray in the Synoptical Flora. As indicated in the opening paragraph of this note, the latter name is a later homonym. Some other names are similarly disbarred. Other names treated by Gray as synonyms, such as *S. pallidus* Torr., seem very doubtfully identified. Torrey's brief account called for a *yellow*-flowered plant of *fields*, with lanceolate-ensiform leaves and flowering in July. That sounds like some

[1] A package of photographs of types, arranged for two years ago, was mailed in Paris on September 1 and was delivered in Cambridge on December 6, 1939, more than 3 months en route!

form of *Lactuca canadensis*. The identity of *Sonchus biennis* Moench is not absolutely established but Gray had no doubt about it; and Moench's comparison of it with *S. alpinus* L., a European species with which our plant was much confused by early European authors (including Linnaeus) makes the identification reasonable. I, therefore, take up *L. biennis*, at least until Moench's type at Marburg can be examined. At any rate, we can use for our plant neither of the familiar names, *L. leucophaea* nor *L. spicata*.

The following forms should be noted.

L. BIENNIS, forma **integrifolia** (T. & G.), comb. nov. *Mulgedium leucophaeum*, β. *integrifolia* T. & G. Fl. ii. 499 (1843). *L. spicata*, var. *integrifolia* (T. & G.) Britton in Mem. Torr. Bot. Cl. v. 350 (1894). *L. spicata*, var. *aurea*, forma *integrifolia* Jennings in Ann. Carnegie Mus. xiii. 443, pl. 33 (1922).

L. BIENNIS, forma **aurea** (Jennings), comb. nov. *L. spicata*, var. *aurea* Jennings, l. c. 440 (1922).

III. ON TWO WEEDY CRUCIFERS

REED C. ROLLINS[1]

DURING the last few years, weed specialists and agronomic botanists in America have become aware that two species of pernicious crucifers were passing in weed-surveys and bulletins as the same plant. Weed-manuals have usually given the common name of these plants as "hoary cress" or in some cases as "white-top". From the striking similarity of the two species, which have frequently been found growing in the same field, it is no wonder that they have been confused. Yet, taxonomically, the two have usually been known in separate genera under the names of *Lepidium Draba* L. and *Hymenophysa pubescens* C. A. Meyer. Both are introductions from the Old World and are apparently spreading rapidly, particularly in western North America. Repeated queries regarding the systematic position of these species have prompted a detailed examination of each with a view to determining their generic relationships.

Historically, *Lepidium Draba*, so-called, has often been thought of as an aberrant species in the genus *Lepidium*. Lin-

[1] Society of Fellows of Harvard University.

naeus himself in the tenth edition of his Systema and second edition of Species Plantarum shifted it from *Lepidium* to *Cochlearia*. Since that time, "*L. Draba*" or one of its numerous subspecies, varieties or forms has been placed, by different authors, in no less than five genera[1] other than *Lepidium*. Almost without exception, treatments of *Lepidium* have either excluded "*L. Draba*" or placed it by itself in a separate section or subsection of the genus. Thus, nearly everyone who has dealt with the plant has been impressed by its singular peculiarities and was not satisfied to give it equality with the general run of species in *Lepidium*. Some of the salient points of difference between "*L. Draba*" and the other species of *Lepidium* may be summarized as follows: 1, the fruits of "*L. Draba*" are indehiscent, those of *Lepidium* are dehiscent; 2, the siliques of "*L. Draba*" are neither strongly flattened nor carinate-margined, while in the rest of *Lepidium* the siliques are strongly flattened contrary to the narrow septum and the margins are either carinate or at least strongly compressed; 3, the siliques of "*L. Draba*" are somewhat inflated (markedly so in var. *repens*), whereas the siliques of *Lepidium* proper are uninflated; 4, the nectar-glands in "*L. Draba*" are comparatively large and well developed, completely surrounding the base of the single stamens and subtending the paired stamens but in the rest of *Lepidium* the nectar-glands are small, poorly developed, merely subtending the single stamens and only weakly developed below the paired stamens, or are absent entirely. According to Schulz,[2] myrosin-cells are found in the vascular bundles of "*L. Draba*", but none have been found in the vascular bundles of those species of *Lepidium* proper which have been investigated. Although the latter point does not have any practical taxonomic importance, it adds weight to the evidence against a presumed close direct relationship between "*L. Draba*" and other species of *Lepidium*. Taking all available evidence into consideration, it appears to be a mistake to continue "*L. Draba*" as a species in the genus *Lepidium*. The earliest generic name to which this species may

[1] *Nasturtium*, Crantz, Crucif. 91 (1769); *Cardaria*, Desvaux, Journ. de Bot. **3**: 163 (1814); *Draba*, Baumg., Enum. Stirp. Transilv. **2**: 232 (1916); *Cardiolepis*, Wallr., Sched. Crit. 340 (1822); *Physolepidion*, Schrenk, Enum. Pl. Nov. 97 (1841).

[2] Engler's Pflanzenf. **17b**: 416 and 476 (1936).

be referred is *Cardaria* of Desvaux l. c., hence the plant in question should be known as *Cardaria Draba* (L.) Desv.

The striking habital resemblance between *Cardaria Draba* and *Hymenophysa pubescens* suggests a closer relationship between the two than has usually been admitted. A detailed study of *H. pubescens* has not revealed a single valid reason for its not being considered congeneric with *C. Draba*. The siliques of *H. pubescens* are inflated and indehiscent; the seeds are large and have incumbent cotyledons; there is only one seed in each loculus of the ovary; the petals are broad-limbed and narrow-clawed as in *C. Draba;* and the style is of the same type as that found in the latter species. Most authors have separated *Hymenophysa* from *Lepidium* on the basis of its subglobose inflated silique and broad septum, but these characteristics are shared also by *C. Draba* var. *repens*, and to a lesser extent by typical *C. Draba*. The most important character which *Cardaria Draba* and *Hymenophysa pubescens* have in common is an indehiscent silique. In the species of *Lepidium* with which I am familiar, the siliques are definitely dehiscent. The extent of development and disposition of the nectaries of *C. Draba* and *H. pubescens* are similar, and both species possess myrosin-cells in their vascular bundles which seemingly further indicates close relationship. The available evidence indicates that *H. pubescens* should be placed in the genus *Cardaria*, which I should constitute as follows:

1. Cardaria Draba (L.) Desv.; based on *Lepidium Draba* L., Sp. Pl. **2**: 645 (1753). Type species of the genus.

The oldest American specimen of *C. Draba* in the Gray Herbarium, is *E. L. Greene no. 783*, collected near Yreka, California, in 1876. The species is now widely distributed in North America as a noxious weed. It is particularly troublesome in the slightly alkaline soils of many irrigated districts in western America, though it is by no means restricted to this type of habitat. Specimens of *C. Draba* have been seen from Nova Scotia, Massachusetts, Connecticut, New York, New Jersey, District of Columbia, Illinois, Nebraska, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, California, Oregon and Washington.

1a. C. Draba (L.) Desv., var. repens (Schrenk) O. E. Schulz; based on *Physolepidion repens* Schrenk, Enum. Pl. Nov. 97 (1841).

Specimens of the variety have been seen from Alberta, South Dakota, California, Oregon and Washington. O. E. Schulz, l. c., has named these plants forma *macrocarpa*, but the additional epithet is not necessary for a clear understanding of variety *repens*.

2. C. **pubescens** (Meyer), comb. nov.; based on *Hymenophysa pubescens* C. A. Meyer in Ledeb. Ic. Pl. **2**: 20 (1830) tab. 165, and Fl. Alt. **3**: 181 (1831).

The plants of this species which have been introduced into North America are not typical of the species as originally described or of specimens coming from Central Asia. Our weeds have a much more elongated fruiting raceme and smaller siliques than those described and figured by Meyer, l. c., and by Busch.[1] There are four specimens of *C. pubescens* from the Altai region in the Gray Herbarium, all of which have a short dense raceme, compact subcorymbose inflorescence and larger siliques than specimens from North America. On the other hand, a specimen collected in 1939 in the territory of Neuquen, Argentina by A. Chicchi, is typical of the Altai plants. The Argentina collection, so far as I am aware, is the first collection of this weedy crucifer from South America. It should be pointed out that Schulz's illustration in Die Pflanzenfamilien[2] is of the plant which we now have as a weed in the United States and Canada. His figures so nearly match specimens collected in Idaho by Mrs. Soth, which were known to have been sent to him at the Berlin Herbarium,[3] that it is not improbable that these drawings were actually taken from Idaho-grown material. As near as I have been able to learn, the weedy *Cardaria pubescens* as found in North America is an undescribed variety which perhaps originally came from some area south and west of the Altai district of central Asia. Import-records indicate that the seeds of these plants were brought to America as impurities in Alfalfa seed.[4] The variety which is extant in North America is named as follows:

[1] Fl. Sib. et Orient. Extr. 107 (1913).

[2] Engler's Pflanzenf. 2 Aufl. **17b**: 477 (1936).

[3] Science **62**: 509 (1925).

[4] Mr. Herbert Groh of Ottawa is actively interested, and has a forthcoming paper on this subject.

2b. C. PUBESCENS (Meyer) Rollins, var. **elongata** var. nov. Herba perennis; inflorescentiis 4–10 cm. longis; siliquis 2.5–3.5 mm. latis. MICHIGAN: Ypsilanti, June, 1919, *C. Billington* s. n. (G); Aug., 1919, *B. A. Walpole* s. n. (G). IDAHO: Pocatello, July & Aug., 1925, *Mrs. M. E. Soth* s. n. (G, NY, US). WYOMING: near Powell, Park Co., June, 1933, *Rollins 324* (R). COLORADO: Fort Collins, *B. Thornton 1* (US); near La Jara, Aug., 1926, *M. W. Talbot* s. n. (US). CALIFORNIA: edge of an alfalfa field, near Sacramento, June, 1932, *Bellue* s. n. (US). OREGON: near Redmond, Sept., 1922, *Whited 499* (G); near Burns, Harney Co., July 9, 1933, *J. W. Thompson 11960* (G, TYPE; NY, US, *isotypes*); Klamath Falls, June, 1923, *Applegate 3603* (G). WASHINGTON: roadside south of Ellensburg, June, 1933, *Thompson 9047* (G, US); May, 1935, *Thompson 11539* (G, NY, US); near Tonasket, June, 1931, *Thompson 7107* (G, US); wheat field, Pullman, July, 1925, *R. F. Haxton* s. n. (G). Presumably the same plant has been reported from Pennsylvania by J. M. Fogg, Jr.,[1] but I have not seen specimens of the collections cited. Our plants are neither of the following species which have not turned up as weeds in North America.

Although I have not seen specimens of *Hymenophysa fenestrata* and *H. macrocarpa*, judging by their descriptions and notes concerning them, they are also to be included in *Cardaria*.

3. C. **fenestrata** (Boiss.), comb. nov.; based on *Hymenophysa fenestrata* Boiss. in Ann. Sci. Natur. Bot. **17**[2]: 197 (1842). Turkestan.

4. C. **macrocarpa** (Franch.), comb. nov.; based on *Hymenophysa macrocarpa* Franch. in Ann. Sci. Natur. Bot. **15**[6]: 233 (1883). Persia.

CONTRIBUTIONS TO THE BOTANY OF MICHIGAN NO. 17

OLIVER A. FARWELL

This number of the Contributions deals with new varieties and with plants that are, as far as my knowledge goes, recorded for Michigan for the first time and extensions of range.

I extend my sincere thanks to Prof. M. L. Fernald for timely suggestions and comments.

PANICUM BOREALE Nash, var. **michiganense**, n. var., *foliis subtus et vaginis plus minusve pubescentibus pustulatis paginis supra hirsutis et nodorum dorsis ad vaginarum apices pubescenti-*

[1] RHODORA **39**: 190 (1937).

bus.—Foliage pubescent, the underside of the leaves and the sheaths papillose-pubescent and the backs of the nodes between the leaves and their sheaths pubescent, usually densely white-pubescent toward the margins.—Wayne Co.: Detroit, no. 1425 (type, in my herbarium) August 25, 1893. Oakland Co.: Orion, no. 5050, July 7, 1918. Keweenaw Co.: Cliff Mine, nos. 643, August 8, 1888 and 11355, July 16, 1936.

The specific type of this species is said to be glabrous except for some marginal ciliation at the base of the leaves and the lowest papillose sheath.

Poa annua L., var. reptans Haussknecht. This is an unusual form for an ordinarily annual plant; it is perennial by means of the prostrate culms which take root and produce new plants at their nodes. Much branched. Occasional, but may be found to be more prevalent than is supposed if search is made for it. In moist grounds in ravines, on lake shores, and in cultivated grounds. Houghton Co.: Douglas Houghton ravine, no. 10859, June 18, 1935; shores of Torch lake, no. 11924, May 17, 1939; Lake Linden, no. 12248, October 6, 1939.

Calamagrostis lacustris (Kearney) Nash. Kearney cited Porter's collection from Isle Royale (Keweenaw Co.) in his original description; but I believe this is the first record from the mainland of Michigan. Houghton Co.: n. w. shores of Rice lake, no. 12168, September 11, 1939.

Calamagrostis canadensis (Mx.) Beauv. var. Macouniana (Vasey) Stebbins. The following records nearly fill up the gap between its recorded eastern and western ranges, making the range, except for New York, continuous from the Rocky Mountain region to the Atlantic. Wayne Co.: Belle Isle in Detroit River, no. 1502a, June 2, 1896; Wayne, no. 9151, July 6, 1932. Oakland Co.: Rochester, no. 8580, September 10, 1929. Keweenaw Co.: lake Glazon woods, no. 12224½, September 25, 1939.

Nemopanthus mucronata (L.) Trel., var. **chrysocarpa,** n. var., *fructu flavo pallido, majore.*—Differs from the ordinary red-fruited type in its slightly larger, pale yellow fruit.—In swampy ground. Houghton Co.: vic. Rice lake, no. 12140 (type, in my herbarium) August 30, 1939.

Pentstemon laevigatus Ait., var. Digitalis (Sweet) A. Gr. The usual range is from Maine southwestward in a broad belt to Iowa, Oklahoma and Texas. This record extends the range far to the north, it being the first time reported from the Upper Peninsula of Michigan. Houghton Co.: Sawmill Creek valley, Earnest Kilmer of Lake Linden, Michigan, July 11, 1939. O. A. Farwell, no. 11990, July 18, 1939.

Parthenium integrifolium L. Plentiful in clearings at the place cited below. Not before recorded for Michigan. Keweenaw Co.: Agate Harbor Mine, the Misses *Ruth and Frances Lyon* of Calumet, Michigan, September 20, 1939 and *O. A. Farwell,* no. 12236, September 29, 1939.

Lake Linden, Michigan

A Globose Form of Pitch Pine (Pinus rigida) in Virginia. —Pinus rigida Mill. forma **globosa,** forma nov. Arbor globosa compacta; foliis normalibus; strobilis 4.5–5.5 cm. longis, 4.8–5.3 cm. latis, quam eis speciei paullo minoribus.—Virginia: single tree in pasture just south of Hopewell Gap, Bull Run Mountain, Fauquier Co., March 10, 1940, *Allard* 7587 (type no. 1,785,345, U. S. National Herbarium; duplicates in National Arboretum Herbarium, Gray Herbarium, Arnold Arboretum), also 4351, 5688, 6119.

The dimensions of this particular tree are as follows: Height 7 feet, 6 inches; spread of crown 12 feet; diameter of trunk at ground 6.5 inches. This tree developed cones while very small, some of these originating on twigs just above the ground. These are variable in size, the smallest ranging from 1¼ to 1½ inches in length; the largest 2 to 2¼ inches in length.

The specializations and relationships of the fibrovascular bundles, the number and distribution of the resin canals, etc., as determined by microtome cross sections of the needles of this globose form appear to be no different from those of trees of normal growth habit.

The Pitch Pine is of more or less general occurrence as an element of the wooded slopes throughout Bull Run Mountain. It is also an important element of the old field successions everywhere in this area, in many places competing with the Virginia Pine (*Pinus virginiana*), the only other species of pine colonizing in old fields here.—H. A. Allard, Department of Agricuture, Washington.

Volume 42, no. 499, including pages 217–276 and plates 597–605, was issued 15 July, 1940.

NOTICE TO SUBSCRIBERS

Subscription revenue covers less than one-quarter the total cost of publication of RHODORA. The strictest economy is necessary to continue publication on the same scale as has obtained in recent years.

About one-third of our subscribers file their renewal orders through commercial subscription agencies which habitually deduct 10% from every remittance as a commission.

Many remittances reach the management in the form of drafts or checks which are subject to bank collection and exchange charges of varying amounts, owing to Clearing House rules.

For these reasons, the subscription rate to RHODORA has been set at $2.00 *net* per annum payable in Boston or New York funds or their equivalent (i. e. drafts or postal money orders which are collectible in Boston at par). All subscription orders from agencies must be accompanied by remittances at the *net* rate without deduction. Hence all subscribers who require the convenience of agency service must regard the subscription rate to RHODORA as $2.00, plus the charges of agents.

NOTICE TO CONTRIBUTORS

IN accordance with the Editorial Announcement of March, 1931, that RHODORA will follow the provision of the International Rules of Botanical Nomenclature, that the publication of names of new groups will be valid only when they are accompanied by a Latin diagnosis, contributors are notified to see that all new species or other groups proposed by them for publication in RHODORA have Latin diagnoses.

DUPLICATE BOOKS FOR SALE

Blakeslee, A. E. and Jarvis, C. D. New England Trees in Winter. (Storrs Agric. Exp. Stat. Bull. no. 69, June, 1911.) Cloth. **$1.50**

Coulter, J. M. Manual of the Rocky Mountain Region. N. Y. 1885. ..... **$1.50**

Evans, A. W. and Nichols, G. E. The Bryophytes of Connecticut. (Conn. Geol. Survey Bull. 11.) Hartford, 1908. Unbd. **$1.00**

Goebel, K. Organography of Plants, especially of Archegoniatae and Spermaphyta. English ed. by I. B. Balfour. 2 vols. Illus. Oxford. 1900–1905. Half leather. **$6.00**

Paris, E. G. Index Bryologicus. With one Suppl. 1894–1900. Half leather **$5.00**

Sullivant, W. S. The Musci and Hepaticae of the U. S. 1856. Cloth. **$3.00**

Prices include cost of transportation.

Address Librarian,

GRAY HERBARIUM of HARVARD UNIVERSITY,

Cambridge, Mass.

Early Volumes of Rhodora

A limited number of the earlier volumes can still be supplied. Libraries and other subscribers needing to complete their sets should communicate with LUDLOW GRISCOM, Museum of Comparative Zoology, Cambridge, Massachusetts.